1. Applicants' 6/16/2011 amendment has newly canceled claims 2, 5, 16-22, 26-28, 30 & 32, thus obviating all rejections thereover. Other amendments to the claims have corrected issues of clarity as set forth in section 3 of the action mailed 2/16/2011. Applicants have cited paragraphs [0045] & [0082] in the PGPub of this application, however the PGPub is not a part of the scanned file, hence is not an appropriate citation to make for showing support, noting that the instant specification has no paragraph numbers, unless the actual support in the original specification is also cited. It appears that [0045] is citing the paragraph discussing figure for on page 10, line 6-15, showing a single nozzle for supplying plasma gas for plasma processing of the surface by outputting the plasma from a port onto the surface, combined with a liquid drop discharge nozzle. [0082], appears to be the paragraph on lines 17-25 of page 22, which is discussing figure 10(B) using source (29)/drain wiring (30) as masks to etch non-single crystal films (semiconductor film 20 & silicon film 27), indicating that the quantity of reactive gas (plasma fluoride) sprayed for plasma etching by the nozzle units 31 is a large quantity in the exposed silicon film region. The examiner notes that figure 9(C) appears to illustrate a similar differentiation in the quantity sprayed for etching (fluoride gas, SF_6) passivation film 21 (silicon nitrite film) using mask 23 (resist composition) & this figure is described on page 21, lines 12-15, but doesn't discuss quantities from the nozzles.

Applicants' IDS of 4/25/2011 has been reviewed & made of record.

2. **Claims 1, 3-4, 6, 23-25, 29, 31 & 33-34** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent **claim 1**, on lines 6, 14 & 17 there are three separate introductions of undifferentiated limitation of "gas plasma", such that it is unclear whether these limitations should be considered to be the same plasma, completely different plasmas, or somehow overlapping. Particularly noted that while the context of the first one introduced in line 6 is "irradiated from the first nozzle...." &

the second one is "irradiated by an array of nozzles....", there is nothing in the claim language to prevent the first nozzle from being part of the array of nozzles, nor is there anything in the claim language which would require it to be part of it, or other than the identical language of "gas plasma" provide the expectation that it is the same plasma, thus the claim language provides conflicting implications, and lacks clarity. Note with respect to the line 17-18 limitation of "wherein a larger quantity of gas plasma.... than over the pattern", if the intent is to refer to "gas plasma" of line 14 as implied by reference to "the pattern", an appropriate way to identify & differentiate this second gas plasma from the previously introduced one would to be employed language such as --another gas plasma-- in line 14 & --said another gas plasma-- in line 17, or the like. Note that independent **claim 23** has analogous issues which may be similarly clarified, except that there are four introductions of "gas plasma" which lack either antecedents or differentiation, without any reversed word order (see following paragraph). Also, dependent **claims 6, 24 & 31** also recite "gas plasma" without either antecedents or differentiation, such that it is unclear whether a specific gas plasma is being referred to or any gas plasma employed, for all of these claim limitations.

Furthermore in **claim 1**, line 12 the liquid composition is being claimed to be applied "after having irradiated the selected portion with plasma **gas**" (emphasis added), which lacks clear antecedents to the previously introduced "gas **plasma**" (emphasis added), due to both inconsistent terminology (phrases turned around), in no necessary antecedents. Hence, while the implication of the claim language is that the "irradiating the thin film with gas plasma..." is the "after having irradiated..." been referred to, the claim language as presently written does not necessitate this, as it would if this phrase stated --after having irradiated the selected portion with **the gas** plasma", which would refer back to the limitation starting in line 6. It is also observed, as discussed in the 5/17/11 interview, that plasma gas can ambiguously & literally mean either gas that is a plasma or gas that can be used in a plasma.

3. **Claims 1, 3-4, 6, 23-25, 29, 31 & 33-34** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The examiner notes that the support of figures 10(A-B) & 9 (B-C), discussed on pages 21-22 of the original specification, are both significantly narrower than present independent **claim 1**, which is completely generic to all materials being deposited, as layer is to be deposited & etched or used as a mask; however figure 9 very specifically uses a resist composition as a mask while figure 10 uses wiring patterns for conducted drain & sources as masks for etching semiconductor films (generic or Si, either non-single crystalline), either of which are a significantly more specific context than the generic context of independent claim 1, such that why support should be considered for provided these generic claims from very specific processing sequences disclosures is not evident, as broadening the scope from an originally disclosed process may be considered to *encompass* **New Matter**, unless the original specification is shown to provide a broad enough suggestion of scope outside the specific & narrow example. In general, a single specific example, is not considered to provide support for *amendments* that claim a broad concept based on a single example, as the original specification did not set forth that broad concept, so usually adequate support needs to also provide some generalized discussion relating to the specific example. The examiner notes that while the original process claims were very generic, they were not directed to etching using masks, thus do not provide support to generalizing the specific example cited. In other words this claim as written appears to be broader than the scope of the original disclosure, thus as stated above *encompass* **New Matter**.

With respect independent **claim 23**, it deposits a conducted film, which is the generic of the semiconductor films of figure 10, however as a mask it uses a resist composition, which is inconsistent

with the figure 10 example, which is using conductive source/drain wiring as a mask, not a resist; while the example illustrated in figure 9 employs a resist composition as a mask, but is etching a passivation layer made of silicon nitride, i.e. an insulating material. Therefore it is unclear how these two examples which do not correspond to the particular process as set forth in independent claim 23, are supposed to support this process as amended. Therefore, from the cited support it appears the claim 23 also encompasses or contains **New Matter**.

The examiner further notes that the support cited in the original specification, as illustrated in the figures, has an array of nozzles across the entire cross-section of the substrate being treated, and creates a variation in plasma output from the nozzles, by the amounts of plasma discharged from each of the nozzles, however as claimed, an array of nozzles may merely be positioned over the areas where plasma etching is desired, with none over the masked/patterned area, instead of controlling which nozzles have output as illustrated, which while reading on the claims as written, is a different process than is supported. Therefore, in this sense also applicants' claims as broadly written encompass possible nozzle array configurations that do not appear to be contemplated or disclosed by the original specification, which also *encompasses* **New Matter**.

4. The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner

to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The **nonstatutory double patenting rejection** is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5.

Claims 1, 3-4, 6 23-29 & 31-34 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Kiguchi et al.** ((582) or (231)), in view of **Di Dio** (2004/0152329 A1) or Okada et al. (470), plus **Speakman et al**. (6,849,308 B1), considering **Lewis et al**. (5,272,979), as applied to claims 2, 5, 16-17 & 30 above, and further in view of **Yamazaki et al.** (7,189,654 B2).

Applicants' independent claims 1 & 23 have been amended to put the requirement of integrated first & second nozzles in dependent claims 33 & 34, but the obviousness with respect to this feature, remains the same whether in independent or dependent claim limitations. Applicants have clarified their "gas plasma" language, although with new uncertainties as set forth above, however this concept was previously set forth, and still considered covered by this rejection. Applicant has added the new limitation to the present claims, requiring the gas plasma irradiated from an array of nozzles as previously discussed, to now require that irradiation of the plasma provide a larger quantity of gas plasma over

exposed areas, i.e. areas been etched, then over pattern or masks area, however Lewis et al. (979) already of record in this rejection discusses control of single or multiple sources of plasma jet discharges in column 4, line 62-column 5, line 10, teaching the operator of the either single or multiple plasma jet's to control the parameters precisely both with respect to the position & with respect to defining the plasma arc discharges for the purpose of physically transforming points or areas been plasma treated. Therefore, in the above combination as previously presented (but with Lewis et al. no longer optional), it would have been obvious to one of ordinary skill in the art to control either single or plural plasmajets, with respect to their plasma discharge, i.e. which is with respect to the plasma output by the plasma nozzle, thus inherently including the gas of the plasma, so as to control the position at which plasma processing occurs, as suggested by the teachings of Lewis et al. (979). Note that any use of plural nozzles or plasma jets when performing processing as in the present combination does not necessitate any particular configuration, however the teachings of Yamazaki et al. as illustrated in figures 4 , 21, 22 or 23 already suggests a linear array of nozzles, with figures 21C, 21D, 22B, 22C & 23D also suggesting selective control of these nozzles to only impinge on areas being treated, noting column 29 indicates ref.#805 in these figures that the controlled limited delivery from nozzles is of plasma, hence one ordinary skill in the art considering either Lewis et al. or Yamazaki et al., individually or especially in light of each other would reasonably have considered it obvious to control the plasma gas, the plasma discharge from the plasma apparatus, etc. to limit it to those portions of the substrate intended to be treated, whether or not masking is present to protect areas desired not to be plasma etch, as such methods have been shown to be both known in the art & desirable for analogous processing.

Kiguchi et al. (6,599,582 B2 or 2003/0003231 A1), in view of **Di Dio** (2004/0152329 A1) or **Okada et al**. (2002/0014470 A1), plus **Speakman et al**. (6,849,308 B1), further considering **Lewis et al**. (5,272,979), as set forth in section 8 of the action mailed 2/16/11, where it was previously noted that Independent claims 1 & 23 require additional limitations in a more detailed process, which includes or

encompasses the more general processes of independent claim 2 (now canceled), with variations on the initial film deposition on insulating or generic surface (which lacking any specific materials for succeeding steps has very little meaning). Specifically, these claims require that the patterns formed of generic material or conductive material, where it either this is consistent with Kiguchi et al.((582) or (231))'s teaching of employing metal salts or electric conductive materials in solution, however Kiguchi et al. does not specifically discuss that these materials that will create electrically conductive deposits or generic patterns or resist patterns, possibly employed for forming wiring patterns via forming a resist that is a mask pattern over a previous film or pattern, followed by some sort of an etching step to form a conductive pattern or a generic pattern, nor that the entire sequence of steps is repeated at least once. It has been further noted that claim 26 is analogous to claim 2 in that it includes the options that the plasma treatments to produce grooves or holes or roughness. The claims 31 & 32 were added to specify that the etching of a conductive material is via localize plasma discharge from a plurality of plasma discharge ports, which is related to the 9/21/10 amended configuration of an array of nozzles, however it is noted that such plasma patterning is already consistent with Kiguchi et al. in view of Di Dio & optionally Lewis et al., especially considering that Kiguchi et al. include teachings of post-treatment in combination with the pretreatment & depositing, where those treatments may include plasma, with references to plural nozzles (figures 18-19; col. 6, lines 35-67+) used in processing, thus while the specifically illustrated nozzles are for droplets, since the droplet depositions are performed in tandem with pre-&/or post-treatments (i.e. equivalent of integrated), plus the plasma treatments as discussed above are inclusive of employing nozzles, this would reasonably have suggested to one of ordinary skill in the art that nozzle arrays would have been employed for plasma treatments also, either before or after droplet deposition, in order to derive taught benefits of pattern processing employing inkjet deposition techniques.

However with respect to specific use of patterning & etching configurations, **Yamazaki et al.** ((654): abstract; figures 3 & 4; claims, esp. 1-2, 5, 7, 10, 12, 15, 17, 19, 21 & 23) teach processes of

further treating a deposited metal layer on a dielectric surface by selectively depositing in **masking material** thereon & **plasma etching** via a plasma device employing a **nozzle** in order to **selectively etch the periphery** of the conductive layer in order to form or prefect a wiring pattern, which is consistent with the new requirements for both patterning & localized plasma discharge, noting figure 4(B), described col. 11, lines 33-46 illustrates the required plural nozzles. Therefore, it would've been obvious to one of ordinary skill in the art that given Kiguchi et al. ((582) or (231)), especially in view of Di Dio et al. or Okada et al. (470), & optionally considering Lewis et al., as discussed above, which provides reasons why pretreatment is desirable, including plasma treatments (sputter etching to roughen, to etch partitions or banks, etc.), plus options of depositing conductive layers as claimed; hence to further treat such layers as taught by Yamazaki et al. (654), in order to perfect the conductive pattern layer for use as a wiring layer, as electrically conductive metal patterns are conventionally used as wiring layers, plus as the deposition & plasma treatments taught by Yamazaki are consistent with further treatment & deposition options as discussed by the above combination, especially considering the teachings therein that one may combine multiple options in order to produce the overall process, as well as considering that the taught related art relevant to the patterning processes of the primary reference suggested circuit patterns.

6. **Claims 1, 3-4, 6, 23- 25, 29, 31 & 33-34** are rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-24 or claims 1-16 of U.S. Patent No. **7,189,654 B2** (Yamazaki et al.) or **7,625,493 B2** (Yamazaki), in view of **Kiguchi et al.** ((582) or (231)), further in view of **Di Dio** (2004/0152329 A1) or **Okada et al**. (470), plus **Speakman et al**. (6,849,308 B1), considering **Lewis et al**. (5,272,979), all references discussed above.

The additional limitation of the claims as amended 6/16/11 requiring larger quantity of plasma irradiated on two regions not covered by the pattern or the mask are not explicitly set forth in these patented claims, however the use of plural nozzles was previously discussed for this combination, and as discussed above in section 5, Lewis et al. (979) of this combination already provides teachings & advice

to control output of plasma jets whether one employs a single plasma jet or plural plasma jets, to coincide with the areas one desires to be plasma treated, such that one of ordinary skill in the art would find these additional limitations obvious in the present combination for reasons analogous to those as set forth above.

The claims of copending patented cases by overlapping inventors where with respect to copending **(654) patent** claims have been amended to have a new variation of overlapping subject matter. Copending (654) claims are depositing the initial conductive layers via a choice of techniques, i.e. CVD, evaporation or sputtering to produce a layer considered to read on a thin film, however the claims employ techniques effectively reading on claimed masking & etching procedures, which in the copending cases are specifically for perfecting the conductive deposition for use as a wiring configuration via use of a selectively deposited resist layer & etching, where the claims differ by not requiring the claimed plasma pretreatment before resist deposit or conductive patterning, via use of the claimed integrated nozzle pairs. However, given the teachings of Kiguchi et al. ((582) or (231)) as discussed above, it would've been obvious to one of ordinary skill in the art to use such integrated pretreatment & depositing means for depositing an electrically conductive pattern or resist patterns (e.g. masks), in order to aid in selective patterning deposits having enhanced affinity to create desired patterns, especially considering Kiguchi et al. teach such treatments may include plasma treatments, such as Ar sputtering, which would reasonably have been considered to encompass roughening, where plasma treatments or other treatments may be employed before &/or after droplet deposition, where those treatments employ plasma nozzle structures, thus noting that copending claims such as 5-6, 10-11, etc. which employee nozzle structures for plasma are consistent with Kiguchi et al. Also, note that as the technique of the initial deposition of the conductive pattern in copending (654) does not appear to be critical given the ability to depositing via multiple different techniques, additional or alternative deposition techniques used therewith would have been considered obvious variations.

With respect to the copending **(493) patent**, the claims therein are similar to those of (654), where the claims differ by not requiring a plasma pretreatment before deposition of variously claimed generic or resist or conductive liquid droplets deposited via nozzles, thus not requiring the integrated droplet nozzle/plasma nozzle structure, nor the specific plasma treatment with respect to formation of grooves, holes or roughness, however as seen above with respect to Kiguchi et al. ((582) or (231)), both the integrated nozzle structure & the act of and desirability for pretreatment via plasma is known in the art, hence dependent on particular substrate confirmation & liquid affinities, it would've been obvious to one of ordinary skill in the art to employ the teachings of Kiguchi et al., in view of Di Dio or Okada et al. (470), plus Speakman et al., to determine appropriate & desirable plasma pretreatment techniques dependent on particular materials & configuration desired in a product, employing integrated plasma & drop delivery head structure, as discussed above.

7. **New art** of interest includes: Chandra et al. (2001/0035129 A1) directed to arrays of focused plasma spray nozzles, which are controlled to project plasma only where desired on a substrate, showing these concepts are old & well-known; and **Larson et al**. (2007/0021935 A1) directed to control a plasma gas flow from plasma chambers, including for plasma gas flow through an orifice array ([0002]).

Other art of interest previously cited with respect to plural plasma nozzle arrays includes **Nakamura** (7,824,520 B2) & JP 2002-343725 A by Kitahata Hironairi, which references are considered supportive of above obviousness of such plasma nozzle arrays, thus cumulative to the above rejections.

8. Applicant's arguments filed 6/16/11 & discussed above have been fully considered but they are not persuasive.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan, can be reached at (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1717

MLP/dictation software

8/29/2011